PSYCHOLOGY OF THE BLIND

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PSYCHOLOGY OF THE BLIND*

By C. F. Fraser, K.B., LL.D.

Psychology is a science conversant with the states of the mind. It is the science of the conscious and subconscious mental life. Through the impressions of our bodily senses we gather experiences. These experiences are mentally realized, analyzed, compared and classified, and thus experiences are ripened into perceptions, perceptions into knowledge and knowledge into thought.

The science of psychological experience is confined to the individual. It is unshared experience, whereas in the physical sciences we deal with experiences common to the world and shared by everyone alike. Psychology deals with the object as I see it, with the sound as I hear it, with the odor as I smell it, with the hunger that I feel and with the emotions which I experience.

For centuries the philosophers of the world have been endeavoring to establish the relation of mind to body, but while distinct progress has been made, it has remained for psychology, the youngest daughter of science, to express the relationship in scientific terms and to open up a new and broad field for scientific investigation.

In the early days of my work in this school my interest in the mental conceptions of the blind was aroused by the discovery that the power to visualize objects perfectly was limited to those pupils who had retained perfect sight until they were from eight to ten years of age, while others who had lost their sight between four and eight years of age visualized imperfectly. Others again who were born blind, or who became blind shortly after birth, entirely lacked the power of visualization. I made many experiments to prove the correctness of my conclusions. At a later date my interest in the psychology of the blind was greatly quickened by association with one who had made a special study of the subject. I refer to Dr. Alexander Fraser, at one time a medical stu-

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dent in the University of Dalhousie, Halifax, N. S., and now Professor of Pathology, New York University & B. V. H. Medical College, and Assistant Pathologist to St. Vincent's Hospital. Together we tested eighty of the pupils of the school. Fourteen of these had lost their sight at eight years of age and upwards, thirty had become entirely blind between four and eight years of age, while thirty-six were born blind or became blind before four years of age. Placing a cube upon the table we asked each pupil to state how many sides of the cube he could see at once. Sixteen of them declared that they could see three sides, twenty-eight were certain that they could see four or five sides at a time, three of them could see but one side at a time, while thirty-three could see all six sides of the cube. Further experiments confirmed the first tests. The pupils were for the most part between ten and fifteen years of age. Those in the first class, namely those pupils who had lost their sight at eight years of age and upwards, visualized correctly seeing three sides of the cube; those in the second class, namely, those who lost their sight after reaching four years of age, visualized imperfectly, seeing four or five sides of the cube at once; those who were born blind or became blind shortly after birth lacked true visualization, thirty-three of them affirming that they saw all six sides of the cube at one time, while three of them saw but one side.

Pondering the results of the test with the congenital blind I was forced to the conclusion that they did not visualize in the sense that people with sight used this word and therefore that they could have no visual sense of form. In order to determine whether what they called "Seeing six sides at once" was a true "Seeing at once"—i. e., a synchronous grasping of the six sides, further tests were made. In answer to my question as to which side of the cube they saw first they all agreed that it was the upper face. There was not the same unanimity as to the front, back, right and left faces of the cube but again they all agreed that the lower face or that on the table was the last face they saw. The language is the language of persons with sight, which all blind persons naturally use, but the psychic event taking place in the minds of these young people was simply a rapid succession of tactual images realized psychologically as a cube. Further tests were made with the congenital blind as to their conception of other objects. For example, the pupils were asked what they thought of first in thinking of an armchair. The majority of those tested replied that they first thought of the right

arm of the chair, then of the left, then of the seat, then of the back and finally of the legs. A few thought of the left arm first, then the right, seat, back and legs. A still smaller number first thought of the seat, then of the right and left arms, back and legs. The greater number follow in imagination the order of perception for the right-handed, viz.—right arm, left, seat, etc. It is quite possible that those who thought of seat first serve to bring about an interesting point. It would be natural to suppose that the "order" in imagination is determined by mere "repetition" of the perception, but I think this is not so. The "order" is determined rather by "interest." The most interesting thing for the majority is "the finding" of the seat—hence the order of actual perception is determined. To the few the interesting thing is the "support" and the order of perception, which undoubtedly was the same for all, is neglected. These tests with many others proved that the mental conception of the congenital blind as to the appearance of objects differs from those of persons with sight, the difference being the result of the impressions made upon the mind by sight and by touch respectively. Sight is a comprehensive sense and through it persons who see receive a synchronous impression of the objects at which they are looking. They first see the object as a whole and afterwards take in the details. The sense of touch is limited to what comes in contact with the finger or other part of the body, hence the impression conveyed to the mind is made up of many individual sensations, or touches, which mentally give to the blind their conception of the appearance of the object touched.

The organ of touch is the skin of the whole body, including the membranes which line the mouth, the nostrils and other internal organs. Under the true skin are minute elevations, and investigation proves that these elevations are developed to their greatest degree in those parts of the body where the touch is most sensitive. Professor Webber, a distinguished German physiologist, instituted experiments to test the degrees of acuteness of touch in different parts of the body. Dr. Webber's tests have since been confirmed most fully. The tests prove that the sense of touch is most acute on the tip of the tongue and the tips of the forefingers. Blind women may frequently be seen threading their needles with the tongue. John Gough, the distinguished blind botanist, used to examine all unfamiliar plants with the tip of his tongue, although the tips of his fingers were as a rule sufficient for all practical purposes. In his old age a rare plant was placed in his hands.

After examining it he gave its name, remarking at the same time that he had only seen one specimen of the plant before, and that was fifty years ago.

Touch impressions with the blind must be actual impressions, or as one writer puts it, "With the blind actuality is tactuality."

Democritus, the ancient philosopher, was wont to say that all the senses were more or less modifications of the sense of touch. The truth of this saying is better understood when we realize that our special senses receive their impressions from the impact upon the organs of external forces. It is for this reason that touch is spoken of as the primary or mother sense.

In 1902 Dr. Griesbach, President of the German Association of School Hygiene, made a series of tests in order to compare the strength of the sense of touch in seeing and blind persons of the same age, and also to compare the touch impressions made upon the third, fourth and fifth fingers of the blind with those of the first fingers. For these experiments he used a pair of compasses with delicate rounded points, and much to his own surprise he found that the impressions made by the two points of the compasses could be distinguished in the second, third and fourth fingers of the blind at a shorter distance than the two points could be realized by the forefinger. In other words if the compasses were a line apart their points would impress themselves upon the forefinger of a blind person as one point, whereas the impressions made upon the second, third and fourth fingers would be those of two points.

Dr. Griesbach made many hundreds of experiments as to the comparative delicacy of touch in persons with and without sight. At the same time he tested the senses of hearing and smell. He sums up the results of his investigations in the following paragraphs which are herewith quoted in full:

1. "In the faculty of distinguishing impressions produced by touch there is in general no essential difference as regards the time free from labor between the blind and seeing. Small differences speak in favor of the seeing.

2. "In persons blind from birth the acuteness of the sense of touch is somewhat less than in seeing persons. In a few cases the rest of the sensorium also suffers in persons blind from birth.

3. "The blind have a less acute sense of touch in the tip ends of the forefingers than the seeing; and in the blind there

is a difference between the two forefingers as regards the faculty of receiving impressions.

4. "The blind need, especially as regards the hands, a stronger impression than the seeing if a distinct impression of touch is to be produced.

5. "In the faculty of locating the direction of sound there is no difference between the blind and the seeing.

6. "The ability to locate the direction of a sound varies in the blind as much as in the seeing and in both is to a very great degree shaped by the individuality of each person.

7. "As a general rule the direction of a sound is determined by the blind and seeing more accurately by hearing with both ears than only with one ear.

8. "There is no difference between the blind and seeing as regards the distance at which a sound can be heard and located.

9. "There is no relation between the distance at which sounds can be distinguished, and the ability to locate them either in the blind or seeing.

10. "There is no difference between the blind and seeing as regards the acuteness of the sense of smell.

11. "The blind to a greater degree get tired by manual labor than the seeing of the same age.

12. "The blind of the same age get tired quicker by manual labor than by mental work. This is not the case with the seeing of the same age.

13. "There is no essential difference in the degree of tiredness by mental work between the blind and seeing of the same age. Slight differences speak in favor of the seeing."

The general public are wont to attribute to those who are blind marvelous faculties of touch and hearing. In these respects the blind are regarded as abnormal and everything that is done by them is considered more or less wonderful.

On the contrary Mr. Kunz, a German educator of the blind, endeavors to establish in his booklet dealing with the Physiology of the Blind that persons deprived of sight have a less sensitive touch, and less acute hearing than persons with sight. The apparent contradictory fact that persons with sight are unable to read point print, which the blind read without difficulty, he tries to explain away by saying "that the finger of a person with sight having a very acute sense of touch will also feel the weaker impression of the letters of either side and will mix up these letters, i. e., not knowing which points belong to one and the same letter, whilst a finger not possessed of so acute a sense of touch will hardly

take notice of the weaker impressions produced by the letters of either side."

Believing that Mr. Kunz' premises and conclusions were incorrect and admitting that the sense of touch of persons with sight might be quite as sensitive as that of those without sight, I made a number of experiments with point letters placed at such a distance apart that the finger could cover not more than one letter at a time. The result proved that persons with sight perfectly familiar with the characters of the Braille alphabet were unable by touch, unaided by sight, to readily recognize the letters, whereas the blind person recognizes them without the slightest difficulty. In view of these experiments I came to the conclusion that while from a physiological standpoint the impressions made by touch upon the blind and seeing might be equal in strength and accuracy, the touch of the blind was psychologically reinforced by the mental faculties of attention and discrimination, hence they read with ease that which could not be deciphered through touch by the person with sight.

We frequently speak of the trained and educated eye, meaning thereby, not that the power of sight has been increased but that the power of observation has been acquired. In like manner the sense of touch is not keen until it has been taught to habitually observe. Our senses are not quickened by blindness, but they may be developed to a remarkable degree by careful and systematic training. Dr. Alexander Fraser says: "The senses, and indeed the whole nervous system are nothing more than a system of communication—in the psychological realm, communication between the world without and intelligence within. The mind is dependent for its development on the senses only in this sense and not absolutely. It is dependent on them much in the same way as we are dependent on our habits. We are helpless without our habits and find it most difficult to do things in new ways—but not impossible. The association between the mind and the senses as existing today is an *historical* one and a *good* one, but not the only one that might have been, and are we quite sure that it is the *best* one?

"It seems to me that in this wonderful plasticity of the human mind and its merely relative, historical dependence on the material senses, lies the hope of the blind, and it seems, too, that the most promising field for the realization of that hope is in the psychological study of not merely the sense phenomena but of the higher functions of the mind."

The intellectual superiority of the sense of touch as com-

pared with the senses of taste and smell is apparent, the impressions of the former being in all respects more clearly defined.

The power to retain in the memory sensations of touch is shown by the blind recognizing individuals after many years by shaking hands with them.

Prescott, the historian, was wont to say "that the world of the blind is circumscribed by the little circle which they can span with their own arms; all beyond has for them no real existence." I cannot concur with this view of the limitations of the world of the blind. From an intellectual standpoint Prescott disproved his statement, having extended the confines of his world so as to include Spain, Mexico, and Peru. Even from a physical standpoint the world of the blind is circumscribed by hearing rather than by touch.

Through the sense of touch blind persons acquire an unlimited amount of knowledge. They also enjoy many sensations of pleasure, and experience other sensations less agreeable. Smoothness and softness are sensations which excite emotions of pleasure, while hardness and roughness arouse emotions akin to pain.

Blind persons frequently avoid contact with trees and posts on the sidewalks, and with other objects in their homes through being made aware of such obstacles by the impression made upon their faces from the sudden condensation of the air. In walking we drive before us a slight wave of air. This is pushed on until it strikes a solid body, then the wave of air is thrown back upon the face and produces a slight sensation which is at once taken as a warning by the blind pedestrian. This facial sensation is not necessarily confined to persons who are blind but is occasionally experienced in the dark by persons with sight.

Sight has been well designated as the Queen of the Senses. Psychologically it is a characteristic of vision that it presents objects in synthesis while all the other senses represent them in parts.

Those who are blessed with sight receive much valuable knowledge subconsciously and in this respect are at a great advantage as compared with those deprived of sight.

To man in general light is regarded as one of the purest of organic gratifications. This is admirably voiced by the old Hebrew writer who says: "The light is sweet, and a pleasant thing it is for the eyes to behold the sun."

With the congenital blind it is impossible to imagine light. It is equally impossible for them to imagine color. Many

erroneous statements as to the ability of blind persons to distinguish colors by touch have been given wide publicity, but upon investigation it has been proved that the discrimination in selecting fabrics of different colors was dependent entirely upon the texture of the materials. The blind have learned by experience that the dyes used in various cloths make the surface hard, rough, smooth or silky. A red dye used upon certain material will always make the surface rough, whereas a green dye used upon a similar material will make its surface appear very smooth. It is therefore not surprising that blind persons have been credited with the faculty of telling color by touch. Color is a constant creation dependent entirely upon light, hence if the blind cannot see light they cannot see color and as they cannot recognize light by touch it is obvious that they cannot recognize color.

The sense of hearing is to the blind of the very highest value. Through it social intercourse with their friends is made possible. Through this sense they enjoy many of their greatest pleasures, such as the singing of birds, the hearing of music in all its forms and the sounds of nature with which they are surrounded. The sense of hearing coupled with the faculty of attention enables blind persons to move through the streets with comparative ease and safety. They note the vehicles that pass along the highway and can readily recognize the various sounds made by the tramcar, automobile, carriage or heavily laden dray. They likewise recognize those who may pass them on the sidewalk. To judge by the step on the pavement this one is carrying a heavy burden. The light step of a child is noticed, as is also the faltering step of an aged person. The trained ear learns to estimate distance, to judge direction and to be warned of a possible danger. Appreciation of the intensity and pitch of sounds has also proved most helpful. There is no need of further accentuating the value of hearing to the blind. It is the channel through which they may receive a very great part of their education. The possession of this sense enables the blind to follow many occupations and to achieve success in many walks in life. Every blind person thanks God for being able to hear.

I do not think that the sense of smell is developed in the blind to any remarkable degree, but with the deaf-blind its acuteness has enabled them to recognize odors which are absolutely insensible to other persons. Laura Bridgeman, the famous deaf-mute of the Perkins School for the Blind, would instantly recognize anyone that she had met before by the smell of his hand or glove. If she met a stranger

she invariably smelled his hand, and Dr. S. G. Howe asserts that the impression made upon her was so strong that she could recognize him long after by smelling his hand, or even his glove if just taken off. The blind deaf-mute, James Mitchell of Scotland, possessed a remarkable keenness of scent which enabled him to discover by smell the presence of a stranger in a room. It is said that he could point out the part of the room in which the stranger stood. Julia Brace, according to Dr. Howe's record, possessed the most acute sense of smell of anyone with whom he ever came in contact. "She smelled at everything which came within range of the sense and never forgot anyone with whom she had shaken hands."

It has been well said by Rousseau in contrasting taste and smell, that taste is the only sense which has nothing to say to the imagination. Odors excite the imagination and affect us not so much by what they furnish as by what they lead us to expect.

It is a somewhat remarkable fact that blind persons retaining the power to visualize always see in their dreams. These persons may be entirely blind and have been blind for many years, but in dreams they have perfect sight. The congenital blind when dreaming recognize no change between their waking and sleeping hours.

I trust as educators of the blind we will more and more realize that the congenital blind are dependent for first hand knowledge upon models of all kinds, simple and complex, and that their education along the lines of touch impressions should be pursued systematically. I also trust that we may fully realize the pleasures and advantages derived by a majority of the youthful blind from the power to visualize and that efforts will be made to discover means whereby this power of visualization may be strengthened and made perfect.

The psychology of the blind opens a wide field for experiment and investigation and I feel confident that in the future this special branch of psychology will receive more attention than it has in the past, and that as educators of the blind we will hail with pleasure any knowledge gained that may make the training of the youthful blind more practical and more successful.

In closing this paper I desire to acknowledge my indebtedness to many eminent psychologists from whose works I have drawn inspiration.

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